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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,367	09/30/2003	Liang Jiang	132347-1	5979
6/147 7590 04/22/2009 GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309				
EXAMINER				
ROE, JESSEE RANDALL				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
04/22/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/675,367

**Applicant(s)**

JIANG ET AL.

**Examiner**

Jessee Roe

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 5 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 2, 4, 6, 8 and 10-23 is/are pending in the application.
- 4a) Of the above claim(s) 11-18, 20 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 6, 8, 10, 19, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 6 February 2009.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Status of the Claims*

Claims 1-2, 4, 6, 8 and 10-23 are pending wherein claims 6 and 11-12 are amended, claims 3, 5, 7 and 9 are canceled; and claims 11-18 and 20-21 are withdrawn from consideration.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4, 6, 8, 19 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada (JP 11-217644).

In regards to claim 1, Hamada (JP '644) discloses a nickel-containing alloy having a composition relative to that of the instant invention as shown in the table below (abstract and [0017]).

Element	From Instant Claims (weight percent)	Hamada (JP '644) (weight percent)	Overlap (weight percent)
Al	about 1.5 – about 4.5	0.01 – 3.0	about 1.5 – 3.0
Ti	about 1.5 – about 4.5	0 – 2.0	about 1.5 – 2.0
Nb	about 0.8 – about 3	0 – 2.0	about 0.8 – 2.0
Cr	about 14 – about 28	18 – 25	18 – 25
Zr	up to about 0.2	0	0
Co	about 10 – about 23	17 – 23	17 – 23
W	about 1 – about 3	0 – 10	about 1 – about 3
Ni	about 40 – about 70	35 – 64.99	about 40 – 64.99

The Examiner notes that the composition of the nickel-containing alloy disclosed by Hamada (JP '644) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amounts of aluminum, titanium, niobium, chromium, cobalt, and tungsten from the amounts disclosed by Hamada (JP '644) because Hamada (JP '644) discloses the same utility throughout the disclosed ranges.

With respect to the recitation "wherein the atomic ratio of aluminum to titanium is about 0.5 to about 1.5", the Examiner notes that Hamada (JP '644) discloses that titanium and aluminum would be effective in improving the gamma prime phase [0022]. Furthermore, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Saklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of titanium and aluminum from the ranges disclosed by Hamada (JP '644) such that the formula would be satisfied because Hamada (JP '644) teaches the same utility throughout the disclosed range.

With respect to the recitation "with the proviso that the nickel-containing alloy is substantially devoid of tantalum", Hamada (JP '644) discloses less than or equal to 2.0

weight percent tantalum, which would include 0 weight percent (i.e. does not necessitate the addition of tantalum to the nickel-containing alloy) (abstract and [0023]).

In regards to claim 2, Hamada (JP '644) discloses that 0.01 to 5.0 weight percent titanium and aluminum would be present in the nickel-containing alloy, which overlap the range of about 3 to about 9 weight percent titanium and aluminum as claimed in the instant invention (abstract, [0017] and [0022]).

In regards to claim 4, Hamada (JP '644) discloses that 0.01 to 7.0 weight percent titanium, aluminum and niobium would be present in the nickel-containing alloy, which overlaps the range of about 3 to about 12 weight percent titanium, aluminum, and niobium as claimed in the instant invention (abstract, [0017], [0022], and [0023]).

In regards to claim 6, Hamada (JP '644) discloses less than or equal to 0.5 weight percent hafnium (abstract, [0017] and [0024]).

With respect to the amended feature omitting zirconia from claim 6, the Examiner notes that this does not change the grounds of rejection.

In regards to claim 8, Hamada (JP '644) discloses less than or equal to 0.5 weight percent carbon (abstract, [0017] and [0025]), which would encompass the range of about 0.02 to about 0.15 weight percent carbon as instantly claimed.

In regards to claim 19, Hamada (JP '644) discloses that the nickel-containing alloy composition would be used as the combustor liner of gas turbines (abstract and [0017]).

In regards to claim 22, Hamada (JP '644) discloses 0 to 2 weight percent niobium (abstract, [0017] and [0023]), which overlaps the range of about 1.25 to about 3 weight percent niobium as instantly claimed.

In regards to claim 23, Hamada (JP '644) discloses 18 to 25 weight percent chromium (abstract, [0017] and [0019]) which reads on the range of about 20 to 25 weight percent chromium as instantly claimed.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada (JP 11-217644) as applied to claim 6 above, and further in view of Twigg et al. (US 3,723,108).

In regards to claim 10, Hamada (JP '644) discloses a nickel-containing alloy that would be used for the combustor liner of gas turbines as shown above, but Hamada (JP '644) does not specify adding about 0.001 to about 0.025 weight percent boron to the nickel-containing alloy.

Twigg et al. ('108) discloses, in the same field of endeavor, adding 0.001 to 0.05 weight percent boron to a nickel-containing alloy having a substantially similar composition in order to improve stress rupture strength (abstract, col. 1, line 69 – col. 2, line 16 and col. 4, lines 1-8).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added 0.001 to 0.05 weight percent boron, as disclosed by Twigg et al. ('108), to the nickel-containing alloy, as disclosed by Hamada

(JP '644), in order to improve stress rupture strength, as disclosed by Twigg et al. ('108) (abstract, col. 1, line 69 – col. 2, line 16 and col. 4, lines 1-8).

Claims 1-2, 4, 6, 8, 10, 19 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheaton (US 3,561,955).

In regards to claim 1, Wheaton ('955) discloses a nickel-containing alloy having a composition relative to that of the instant invention as shown in the table below (col. 2, line 63 - col. 3, line 31).

<b>Element</b>	<b>From Instant Claims (weight percent)</b>	<b>Wheaton ('955) (weight percent)</b>	<b>Overlap (weight percent)</b>
Al	about 1.5 – about 4.5	about 2.5 – 4.75	about 2.5 – about 4.5
Ti	about 1.5 – about 4.5	about 1 – 3	about 1.5 – 3
Nb	about 0.8 – about 3	about 0.5 – 2.5	about 0.8 – 2.5
Cr	about 14 – about 28	about 14 – about 18	about 14 – about 18
Zr	up to about 0.2	about 0.01 – 0.20	about 0.01 – 0.20
Co	about 10 – about 23	about 5 – 20	about 10 – 20
W	about 1 – about 3	about 2 – 4.5	about 2 – about 3
Ni	about 40 – about 70	Balance	Balance

The Examiner notes that the composition of the nickel-containing alloy disclosed by Wheaton ('955) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amounts of aluminum, titanium, niobium, chromium, zirconium, cobalt, and tungsten from the amounts disclosed by Wheaton ('955) because Wheaton ('955) discloses the same utility throughout the disclosed ranges.

With respect to the recitation "wherein the atomic ratio of aluminum to titanium is

about 0.5 to about 1.5", the Examiner notes that Wheaton ('955) discloses that titanium and aluminum would be effective in precipitation strengthening of the alloy (col. 5, lines 8-20). Furthermore, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Saklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of titanium and aluminum from the ranges disclosed by Wheaton ('955) such that the formula would be satisfied because Wheaton ('955) teaches the same utility throughout the disclosed range.

With respect to the recitation "with the proviso that the nickel-containing alloy is substantially devoid of tantalum", Wheaton ('955) discloses that a total of 5 weight percent of the nickel-containing alloy may comprise tantalum plus two times the niobium (col. 5, lines 21-29). However, niobium would be preferred to tantalum from the standpoint of density and cost whereas tantalum would be advantageous from the standpoint of oxidation resistance. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to omit tantalum where improved oxidation resistance would not be required or desired. MPEP 2144.04(II).

In regards to claim 2, Wheaton ('955) discloses about 3.5 to about 7.75 weight percent titanium and aluminum would be present in the nickel-containing alloy, which



would be within the range of about 3 to about 9 weight percent titanium and aluminum as claimed in the instant invention (col. 5, lines 8-50).

In regards to claim 4, Wheaton ('955) discloses that about 4.0 to 10.25 weight percent titanium, aluminum and niobium would be present in the nickel-containing alloy, which would be within the range of about 3 to about 12 weight percent titanium, aluminum, and niobium as claimed in the instant invention (col. 5, lines 8-50).

In regards to claims 6 and 10, Wheaton ('955) discloses about 0.005 to 0.05 weight percent boron, which overlaps the claimed range of about 0.001 to about 0.025 weight percent boron as instantly claimed (col. 2, line 63 - col. 3, line 31).

With respect to the amended feature omitting zirconia from claim 6, the Examiner notes that this does not change the grounds of rejection.

In regards to claim 8, Wheaton ('955) discloses about 0.1 to about 0.17 weight percent carbon (col. 5, lines 35-50), which would overlap the range of about 0.02 to about 0.15 as instantly claimed.

In regards to claim 19, Wheaton ('955) discloses that the nickel-containing alloys would be used as components of a turbine (col. 1, lines 39-66).

In regards to claim 22, Wheaton ('955) discloses about 0.5 to 2.5 weight percent niobium (col. 2, line 63 - col. 3, line 31), which overlaps the range of about 1.25 to about 3 weight percent niobium as instantly claimed.

In regards to claim 23, Wheaton ('955) discloses about 14 to about 18 weight percent chromium (col. 3, lines 20-30) whereas the instant claims recite "chromium is present in an amount of about 20 to 25 weight percent". The Examiner notes that the

instant specification does not define "about" to exclude values such as about 18 weight percent as disclosed by Wheaton ('955) and therefore about 18 weight percent chromium reads on the claim.

### ***Response to Arguments***

Applicant's arguments filed 5 February 2009 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that Hamada (JP '644), in allowing for 0% of titanium and niobium, does not specifically require the presence of these elements and the reference is clear about which elements are required and which are optional.

In response, the Examiner notes that Hamada (JP '644) discloses 0 to 2 weight percent of each of titanium and niobium and although in the disclosure the lower limit is 0 weight percent, the normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages. MPEP 2144.05 II.

Second, the Applicant primarily argues that Hamada (JP '644) fails to disclose or suggest the specific requirement regarding the aluminum-to-titanium ratio. The Applicant further argues that the elimination or minimization of the eta phase does not appear to be suggested and the reference does not appear to be directed to alloy composition which have especially-enhanced creep resistance.

In response, the Examiner notes that in absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine

investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. Applicant's have not demonstrated the criticality of the aluminum-to-titanium ratio. Furthermore, although Hamada (JP '644) may not specify elimination or minimization of the eta phase, such would be expected from the composition disclosed by Hamada (JP '644) since Hamada (JP '644) discloses substantially the same composition. MPEP 2112.01 I.

Third, the Applicant primarily argues that Hamada (JP '644) has nothing to do with alloys which must be free of tantalum.

In response, Hamada (JP '644) discloses less than or equal to 2.0 weight percent tantalum, which would include 0 weight percent. The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages. MPEP 2144.05 II.

Fourth, the Applicant primarily argues that in the combination of Hamada (JP '644) and Twigg et al. ('108) the presence of boron does not appear to be a primary feature in any embodiment of the patent and the combination of the boron teaching with the teachings of Hamada (JP '644) still fails to suggest the key features of the present claims.

In response, the Examiner notes although Twigg et al. ('108) discloses, in the broad disclosure and not in a preferred embodiment, adding 0.001 to 0.05 weight percent boron to a nickel-containing alloy having a substantially similar composition in order to improve stress rupture strength, a reference may be relied upon for all that it

would have reasonably suggested to one having ordinary skill the art, including non-preferred embodiments. MPEP 2123 I.

Fifth, the Applicant primarily argues that there is no suggestion in Wheaton ('955) of titanium-aluminum proportions with minimize or prevent formation of the eta phase and Wheaton ('955) appears to be very much involved with the elimination of the "sigma phase" (col. 2, lines 20-32 and col. 4, lines 6-11).

In response, the Examiner notes that in absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. Applicant's have not demonstrated the criticality of the aluminum-to-titanium ratio. Furthermore, although Wheaton ('955) may not specify elimination or minimization of the eta phase, such would be expected from the composition disclosed by Wheaton ('955) since Wheaton ('955) discloses substantially the same composition. MPEP 2112.01 I.

Sixth, the Applicant primarily argues that Wheaton ('955) clearly allows for the presence of tantalum and the instant invention specifically calls for the absence of tantalum and Wheaton ('955) contains no suggestion that eliminating tantalum can greatly improve creep strength. The Applicant further argues that while this reference relates to the same general field as the present invention, it is directed to a different set of performance issues and alloy phenomena, i.e., sulfidation and the formation of the plate-like sigma phase.

In response, the Examiner notes that Wheaton ('955) discloses that a total of 5

weight percent of the nickel-containing alloy may comprise tantalum plus two times the niobium (col. 5, lines 21-29). However, niobium would be preferred to tantalum from the standpoint of density and cost whereas tantalum would be advantageous from the standpoint of oxidation resistance. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to omit tantalum where improved oxidation resistance would not be required and higher cost would not be desired. MPEP 2144.04(II). Furthermore, although Wheaton ('955) may be directed to the issues of sulfidation and the formation of the plate-like sigma phase, this would not preclude one of ordinary skill from optimizing other associated characteristics of the nickel-base alloy.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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